FINDING OF NO SIGNIFICANT IMPACT
^{233}U STABILIZATION AND BUILDING 3019 COMPLEX SHUTDOWN
AT THE OAK RIDGE NATIONAL LABORATORY,
OAK RIDGE, TENNESSEE

AGENCY: U.S. Department of Energy (DOE)

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: DOE has completed an Environmental Assessment (EA) [DOE/EA-1574] that evaluates the impacts of facility modifications and the processing of uranium-233 (^{233}U) stored at the Oak Ridge National Laboratory (ORNL) and other small quantities of similar material currently stored at other DOE sites. The project objectives are to modify the facility to accommodate the process equipment and operations, process the inventory in order to render it suitable for safe economical storage, and place the Building 3019 Complex in safe and stable shutdown for decontamination and decommissioning (D&D).

DOE action is needed to (1) address safeguards and security requirements, (2) eliminate long-term worker safety and criticality concerns, and (3) place the ^{233}U material in storage in preparation for future decisions regarding disposal. By meeting these needs, DOE will be able to reduce the substantial landlord costs and meet the requirements of the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 97-1, which addresses the safe storage of ^{233}U.

The EA was issued for public comment in December 2006, revised as appropriate based on public comments, and issued as final in March 2007. Based on the results of the analyses reported in the EA, DOE has determined that the proposed action is not a major Federal action that would significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969. Therefore, the preparation of an Environmental Impact Statement (EIS) is not necessary, and DOE is issuing this FONSI.

PUBLIC AVAILABILITY OF EA AND FONSI: The EA and FONSI may be reviewed and copies of the documents obtained from:

U.S. Department of Energy
Information Center
475 Oak Ridge Turnpike
Oak Ridge, Tennessee 37830
Phone: (865) 241-4780

INFORMATION ON THE NEPA PROCESS: For further information on the NEPA process, contact:

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The document can also be viewed at the following website:
www.oakridge.doe.gov

BACKGROUND: Recommendation 97-1 describes actions that the DNFSB considers necessary to ensure the safe storage of ^{233}U-bearing materials in the interim and the longer term. In response to Recommendation 97-1, DOE initiated an inspection program to evaluate the integrity of the stored canisters. In addition, DOE acknowledged the need to process the inventory to a safe, stable form to allow for continued storage. DOE prepared an EA (DOE/EA-1488) in 2004 on its proposal to process and package ^{233}U stored at ORNL, as well as small quantities of similar material stored at other DOE sites; extract thorium-229 (^{229}Th) for medical isotope production; operate the Building 3019 Complex at ORNL during the processing and medical isotope production; and then place the Building 3019 Complex in a safe and stable shutdown for transfer to the DOE program for decontamination and decommissioning. DOE issued a FONSI for that project in December 2004.

In November 2005, Congress directed (1) the termination of the planned medical isotope production, and (2) transfer of the project from the Office of Nuclear Energy to the Office of Environmental Management for disposition of the ^{233}U. In response, DOE has modified the original scope and prepared a new EA to evaluate the impacts due to the installation of processing equipment in Building 3019A; processing, packaging, and storage of downblended ^{233}U; and placing the Building 3019 Complex in safe and stable shutdown for decontamination and decommissioning. The EA was issued for public comment in December 2006, revised as appropriate based on public comments, and issued as final in March 2007.

NEED FOR THE PROPOSED ACTION: DOE action is needed to (1) address safeguards and security requirements, (2) eliminate long-term worker safety and criticality concerns, and (3) place the ^{233}U material in storage in preparation for future decisions regarding disposal.

DESCRIPTION OF PROPOSED ACTION: DOE proposes to (1) modify the 3019 Complex to accommodate processing equipment and support operations necessary to downblend the ^{233}U inventory; (2) process and package the ^{233}U stored at Building 3019 Complex; (3) place the downblended ^{233}U inventory in permitted storage at the ORNL; and (4) place the Building 3019 Complex in stable shutdown and perform surveillance and maintenance activities. The disposal of the downblended inventory and D&D of the Building 3019 Complex are outside the scope of this proposed action. The project would involve several different activities, including:

- Equipment removal from hot cells and laboratories within Building 3019A;
- reconstruction within the existing facility and equipment placement;
- retrieval and inspection of ^{233}U containers within Building 3019A;
- ^{233}U dissolution;
- shipment of depleted uranium oxide (DUO_3) from the DOE Savannah River Site, conversion to depleted uranyl nitrate at Erwin, Tennessee, and receipt of depleted uranyl nitrate at Building 3019A;
- downblending of the ^{233}U inventory and conversion of downblended material to a stable oxide;
- safe storage of the downblended inventory;
- construction of a loading facility to facilitate off-site shipments;
- disposal of secondary waste; and
- facility shutdown and stabilization.

The ^{233}U Disposition Project would be responsible for design and construction of modifications to Building 3019A and its associated facilities in order to implement the proposed action. Building 3019A would be modified and shielded workstations installed to conduct high-radiation work. Criticality safety controls would be put in place to prevent an inadvertent nuclear criticality.

Safe storage of the ^{233}U stored in Building 3019A would be continued, while construction and operations are ongoing, through the revisions of the existing safeguards and security program, configuration management program, authorization basis, and permit(s). Following removal and processing of the stored ^{233}U, secondary waste and equipment, as applicable, would be dispositioned.

ALTERNATIVES: In addition to the proposed action, impacts were evaluated for the no-action alternative. If no action were taken, DOE would continue to have responsibility for the operation of the Building 3019 Complex, and the ORNL inventory of ^{233}U would remain stored within Building 3019A. Continued storage in Building 3019A would require major capital upgrades and retrofits to critical facility systems that have deteriorated due to aging or that may not meet current standards. Significant, additional annual operating expenses would also be incurred to meet the material-handling requirements associated with repackaging and to provide protection against potential nuclear criticality accidents or theft of the material.

DOE dismissed from further analysis alternatives for the continued storage of the ^{233}U inventory at another location either at Oak Ridge or another DOE site; the use of the material as a tag for Russian highly enriched uranium; use in development and testing of a thorium fuel cycle; and its use in analytical safeguards procedures. In addition, DOE dismissed from further analysis the processing of the inventory at the Savannah River Site, the processing through dry-blending alternative, co-processing with TRU waste, and chemical dilution. These alternatives were considered but determined not to be reasonable, and they did not meet DOE's purpose and need. However, DOE has determined that there may be opportunities to process small volumes of ^{233}U bearing material in established on-site processes, if deemed cost effective and safe. DOE is aware there may be a need for small quantities of ^{233}U and will continue to cooperate with potential users for the safe transfer of material.

ENVIRONMENTAL IMPACTS: The EA assessed direct and indirect impacts of the proposed action on the following resources: land use; air quality and noise; geology, soils and seismicity; water resources; ecological resources; cultural resources; socioeconomics; utilities; transportation; waste management; and human health. Cumulative impacts also were assessed.

Under the proposed action, there would be no impact on land use immediately surrounding the Building 3019 Complex or storage Buildings 7572 and 7574 since the areas are currently used for industrial purposes and/or are part of the industrialized portion of ORNL. Storage of the downblended inventory would occur at Buildings 7572 and 7574, which are facilities currently constructed and operating. A loading/unloading facility would be constructed at the storage facilities to facilitate transfer of the downblended inventory. Off-site waste treatment and disposal would only occur at existing permitted/licensed facilities. No cumulative impact to land use would occur.

Potential air quality impacts would include a minor increase in air pollutants from the process off-gas (i.e., entrained nitric acid, NO_x, uranium oxides, and other trace radioactive contaminants). These emissions would be mitigated by a new process off-gas treatment system to ensure that they would not exceed National Ambient Air Quality Standards, and Isotek would be required to maintain compliance with the terms and conditions of permits issued by the Tennessee Department of Environment and Conservation. Because Roane County is designated as an attainment area for all of the national ambient air quality standards, the Clean Air Act of 1970 general conformity rules do not apply. The downblended inventory would be placed in containers equipped with a vent and High Efficiency Particulate Air (HEPA) filter to eliminate any pressure build-up and a radon delay tube to prevent radon gas releases. These containers would be placed inside robust over-pack containers to reduce the exposures to workers and provide secondary containment in the case of an accident. Safe shutdown of the Building 3019 Complex would also reduce air emissions and have a positive cumulative effect on air quality in the vicinity of ORNL. Because the Building 3019 Complex is located within an active industrialized area of ORNL and since no sensitive noise receptors are located in the immediate vicinity, no adverse noise impacts would occur.

Under the proposed action, no effects to geological resources or soils would occur since the activities associated with the proposed project would occur within previously disturbed areas used for industrial applications. Facility modifications would meet the appropriate seismic performance category criteria, and the building should remain stable during and after a seismic event.

No additional adverse effects to water resources would occur under the proposed action. Existing surface and groundwater protection measures at the Building 3019 Complex, such as spill prevention and spill response plans, would be reviewed and modified or continued, as appropriate, based on the final design for the processing and facility shutdown activities. No change in existing storm water capacity or handling would be expected. The safe and secure shutdown of the Building 3019 Complex would substantially reduce the amount of waste and wastewater generated by the existing and proposed processing operations. This would have the positive effect of reducing the potential for a spill or release into the storm water collection system or groundwater. Buildings 7572 and 7574 are active facilities located outside the area of Melton Valley that have undergone remediation and, therefore, has no impact on those efforts. The downblended inventory would be in the form of a solid oxide and would not have an impact on wastewater operations, storm water, or groundwater.

Implementing the proposed action would not result in any adverse impacts to any habitat or wildlife. Habitat in the vicinity of the Building 3019 Complex is highly disturbed and mostly maintained by mowing. This type of habitat also precludes the presence of rare, threatened, and endangered plant and animal species.

Building 3019A is considered to be contributing to the ORNL Historic District and is eligible for listing in the National Register of Historic Places. DOE completed a Project Summary and Archaeological and Historical Review for the proposed modifications to the facility and determined that the proposed action would not have an adverse effect on the exterior physical structure or visual appearance of the building. As a result, DOE determined that no exterior archeological resources would be affected by the proposed action. The Tennessee State Historic Preservation Officer has concurred with the DOE determination. In addition, modifications to Building 3019A will have no impacts on the adjacent Graphite Reactor, which is considered a National Historic Landmark.

Socioeconomic impacts are expected to be minimal. Based on the small number of jobs created and the availability of qualified local workers, no impact on population size is anticipated. Likewise, no high and adverse health and environmental impacts would occur that could have a disproportionate effect on low-income and minority populations. Net jobs lost following the completion of the project will have a negligible employment and income impact in the region of influence.

Any increased utility demand from the proposed action would be within the capacity of the current infrastructure, and no adverse impacts would occur. After the Building 3019 Complex is placed in safe and stable shutdown, the major utility systems serving the facility (i.e., electrical, process, potable, and fire protection water; compressed air; steam; and standby diesel generators) would remain operational until D&D occurs.

No transportation impacts would occur from the transport of materials and equipment associated with the limited construction and modification activities that would take place at Building 3019A, and construction-related traffic would be negligible. Truck transport of depleted uranium oxide, uranyl nitrate, and off-site waste shipments would be conducted by qualified carriers according to all applicable U.S. Department of Transportation and Nuclear Regulatory Commission packaging and transportation requirements. These shipments would not differ substantially from routine operations at ORNL, and any adverse impacts are expected to be negligible.

Impacts from offsite disposal are expected to be minimal compared to impacts from the quantities of waste already disposed of at disposal sites to be selected for secondary waste. Waste minimization measures would be implemented and proper waste characterization, segregation, treatment, storage, and disposal procedures would be followed. All off-site waste treatment and disposal would only occur at existing permitted/licensed facilities. No cumulative impacts would be expected since the incremental contribution of the proposed action to waste generation would be offset, over time, by an anticipated reduction in waste generated once the processing activities were completed and the facility was placed in safe and stable shutdown.

Operations included under the proposed action would not increase chemical or radiological emissions or exposures because operations would be similar to the historical operations of the Building 3019 Complex. The downblended inventory will be packaged in containers equipped with filtered vents to prevent pressure buildup and radon delay tubes to eliminate the release of radon gas. In addition, these packages will be placed in robust over-packs to reduce the probability of an accidental release while in storage. Malevolent acts were considered during this assessment regarding the release of radioactive material but after review, consequences due to malevolent acts were determined no greater than those from natural phenomena. Completion of the project would have many positive impacts, including the elimination of safeguards, security, and nuclear criticality controls. Placing the facility into safe and stable shutdown for D&D would reduce or eliminate associated potential adverse impacts on human health for workers and the public.

DOE has not made any decisions regarding the disposition of the U-233 that is the subject of this EA, but at such time as it does, the NEPA documentation for this project will be supplemented to indicate what the disposal options are, any considerations that may affect DOE's choices, and what decisions DOE has made with regard to disposal of this material. The material is being processed into a form that could be dispositioned at the Waste Isolation Pilot Plant (WIPP) in Carlsbad, New Mexico, or at the Nevada Test Site (NTS). WIPP and NTS personnel have been actively involved in ensuring that the form of the downblended material can be received and that the downblended material can be certified to meet the waste acceptance criteria. If DOE were to propose disposal of the downblended material at WIPP or NTS, DOE would complete an appropriate NEPA review to evaluate the impacts of transportation, receipt, and disposal. DOE would obtain all necessary regulatory approvals prior to disposal.

DETERMINATION: Based on the analyses contained within the EA, and after careful consideration of all public and agency comments, DOE has determined that the ^{233}U Stabilization and Building 3019 Complex shutdown at ORNL does not constitute a major Federal action that would significantly affect the quality of the human environment within the context of NEPA. Therefore, preparation of an EIS is not required.

Issued at Oak Ridge, Tennessee, this ____ day of _____ 2007.

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U. S. Department of Energy
Oak Ridge Office

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